

**Mobile browsers and cloud gaming market investigation  
Apple Supplemental Response to Statement of Issues**

**A. Introduction**

1. In this supplemental response to the Statement of Issues (“SOI”) Apple does not seek to repeat the points made in its original Response to the SOI dated 20 January 2023. Nonetheless, the points Apple made in its original Response remain relevant. In brief, as Apple has demonstrated in its prior submissions:
  - Apple’s approach provides users with a valuable choice, centred around security, privacy and performance – the principles underpinning Apple’s entire business model – between ecosystems, and in fact increases competition.
  - Apple’s WebKit requirement drives competition and innovation, offering developers access to new features and functionalities, whilst also protecting users by not compromising device performance, security or privacy.
  - Apple’s approach is of particular benefit to vulnerable consumers.
2. These points are particularly vital given the CMA and Inquiry Group’s charge that “[i]n assessing the potential sources of harm,” they must consider “aspects of the competitive situation that may, on the other hand, benefit competition and operate to the benefit of customers”.<sup>1</sup>
3. Apple makes this supplemental submission to draw the CMA’s attention to certain significant developments relating to Apple’s business that have occurred since March 2023, when the market investigation was suspended. These developments further demonstrate the points above.
4. In light of those developments, Apple also offers certain observations with respect to the remainder of the market investigation. These observations are offered in the spirit of constructive engagement and with a view to assisting the CMA and the Inquiry Group to conduct a more targeted assessment, which would allow for a richer consideration of salient factors such as privacy, security, and performance. Apple firmly believes that such an approach is critical for the Inquiry Group to be able to reach findings that reflect the realities of these dynamic markets and may form the basis of proportionate and effective outcomes.
5. More broadly, Apple wishes to reiterate that it remains committed to constructive dialogue with the CMA and the Inquiry Group during the remainder of the market investigation.

**B. Developments since March 2023**

**i. WebKit**

6. In the period March 2023 to February 2024, Apple has continued to invest heavily in WebKit to improve performance and add new features and functionalities. Many of these features address concerns raised during the market investigation. Contrary to concerns raised during

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<sup>1</sup> CC3 (Revised) Guidelines for market investigations: Their role, procedures, assessment and remedies, April 2013, para 173.

the evidence gathering period of the market investigation to date, WebKit support for features required by developers is strong and its pace of development and compatibility is high.

#### New WebKit features

7. Between March 2023 and February 2024, Apple added support provided by WebKit for hundreds of new features via several key releases:<sup>2</sup>
  - Safari 16.4 on 27 March 2023, which included support for 119 new features;
  - Safari 17 on 18 September 2023, which included support for 105 new features; and
  - Safari 17.2 on 12 December 2023, which included support for 39 new features.
8. Safari 17.4, which is currently in beta testing, supports 47 new features, and is scheduled for release in March 2024.
9. Through these updates, Apple has provided or will provide new or expanded support for the following features, each of which has been raised during the market study and market investigation process to date:
  - **Push notifications:** Web Push makes it possible for web developers to send push notifications to their users through the use of Push API, Notifications API, and Service Workers. Web Push notifications from web apps work exactly like notifications from other apps. They show on the Lock Screen, in Notification Center, and on a paired Apple Watch. Users can also configure when or where to receive Web Push notifications through the Focus tool. Safari 16.4 allowed developers to enable web push for their webpages or web apps.
  - **Badging:** Through the Badging API, web app developers can display an app badge count, which displays the number of unread notifications within an application, just like any other app on iOS. Safari 16.4 made the Badging API available for web apps the user has added to their home screen.
  - **Offscreen Canvas:** When using Canvas, the rendering, animation, and user interaction usually happens on the main execution thread of a web application. Offscreen Canvas provides a canvas that can be rendered off screen, allowing developers to run tasks in a separate thread and avoid heavy work on the main thread that can negatively impact the user experience. Safari 16.4 added Offscreen Canvas support for 2D operations. Safari 17 added support for WebGL in Offscreen Canvas, bringing the benefits of Offscreen Canvas to 3D.
  - **Screen Orientation:** The Screen Orientation API enables web applications to programmatically adapt the user experience for multiple types of screen orientations. This is particularly useful for applications such as computer games, where users physically rotate the device, but the screen orientation itself should not change. Safari 16.4 introduced preliminary support for this API for developers.
  - **Service Workers:** Safari 16.4 added support for Service Workers and Shared Workers to the Permissions API.

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<sup>2</sup> References to relevant software releases are according to Safari Release Notes, e.g. <https://webkit.org/blog/13966/webkit-features-in-safari-16-4/>; [https://developer.apple.com/documentation/safari-release-notes/safari-16\\_4-release-notes](https://developer.apple.com/documentation/safari-release-notes/safari-16_4-release-notes)

- **Full Screen functionality:** With Safari 17.2 Beta (and in Safari 17.4 beta), Apple is testing support for Fullscreen API on iOS. Fullscreen API adds methods to present a specific element in full screen mode, and to exit full screen mode once it is no longer needed. This makes it possible to present desired content – such as online game controls and UI elements – using the user’s entire screen.
  - **APIs or analytics on Browser performance:** Apple already provides developers with powerful dashboards and reports to help them measure their apps’ performance through App Analytics, Sales and Trends, and Payments and Financial Reports. With Safari 17.4, Apple will offer over 50 new reports through the App Store Connect API to help developers analyze their app performance and find opportunities for improvement.
10. In addition to features specifically raised during the market investigation to date, Apple notes that the following material features have also been made available since March 2023:
- **Compression Streams API:** The Compression Streams API was released in Safari 16.4 and allows for compressing and decompressing streams of data directly in the browser, reducing the need for a third-party JavaScript compression library. This is useful for developers who may need to “gzip” a stream of data to send to a server or to save on the user’s device.
  - **Screen Wake Lock API:** The Screen Wake Lock API, also released in Safari 16.4 provides a mechanism to prevent devices from dimming or locking the screen. The API is useful for any application that requires the screen to stay on for an extended period of time to provide an uninterrupted user experience, such as a cooking site, or for displaying a QR code.
  - **User Activation API:** User Activation API provides web developers with a means to check whether a user meaningfully interacted with a web page. This is useful as some APIs require meaningful “user activation,” such as, a click or touch, before they can be used. Because user activation is based on a timer, the API can be used to check if a document currently has user activation as otherwise a call to an API would fail. This API was made available to developers in Safari 16.4.
  - **Storage API:** Safari 17 provided full support for the Storage API, which gives websites the ability to find out how much space they can use, how much they are already using, and even to control whether or not they need to be alerted before the user agent disposes of data in order to make room for other things.
  - **Fetch Priority:** Fetch Priority allows developers to set the priority of a resource (e.g., an image, script, or linked resource such as a style sheet) in relation to other resources. This can be done via the fetchpriority HTML attribute or as an option passed via the Fetch API. This was made available to developers in Safari 17.2.
11. Crucially, Apple has delivered many of these updates while maintaining significant performance advantages compared to rivals.<sup>3</sup> As websites continue to become more complex, it remains important for Apple to keep pushing the boundaries of performance.
12. Reactions from the developer community to these new releases has been very positive, as exemplified by the tweet from Open Web Advocacy: *“iOS 16.4 is a massive step forwards towards feature parity between Web Apps and Native Apps. Big thank-you to the*

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<sup>3</sup> <https://www.apple.com/safari/>

*Safari/Webkit team for all their hard work*".<sup>4</sup> Numerous commentators have recognised the leading role that Safari has been playing in recent months in terms of feature development.<sup>5</sup>

13. With respect to those features not yet supported, Apple would draw the CMA and Inquiry Group's attention to its earlier detailed technical submissions setting out the security and privacy considerations that underpin its approach. These considerations remain relevant. Apple's approach, driven by the need to maintain its market-leading device performance and robust privacy and security standards in order to provide a safe and trusted platform on which users can rely, means that it will release new features only where they would not compromise device performance, security or privacy.
14. Moreover, WebKit has pioneered new features and demonstrated leadership in supporting web standards. For instance, Apple will be the first to ship alignment on blocks and tables in Safari 17.4, which allows web developers to vertically align UI elements, to be followed by Blink. Similarly, Apple has also led efforts to implement switch control, masonry, text box trim, <model>, WebXR, declarative web push, <hr> in <select>, and third-party private tokens.
15. Apple has also recently led and shipped a variety of other standards. Apple recently shipped a complete version of font-size-adjust in Safari 17.0, which is an elegant solution to conform sizing across different languages and fonts. Firefox followed by finishing their implementation of the feature. Likewise, Apple led and shipped several other standards, such as margin trim, wide-gamut color support, :has(), media pseudo-classes, :user-valid/invalid, inert, URL, WebGPU, Storage Access API, and Web Components.
16. In summary, Apple considers that the evidence set out above taken together provides clear evidence that WebKit in fact provides access to cutting edge feature support without compromising on performance, privacy, or security, and is, wherever possible, responsive to the demands from developments for additional feature support, contrary to the position set out in the SOI.

#### Pace of web standards support

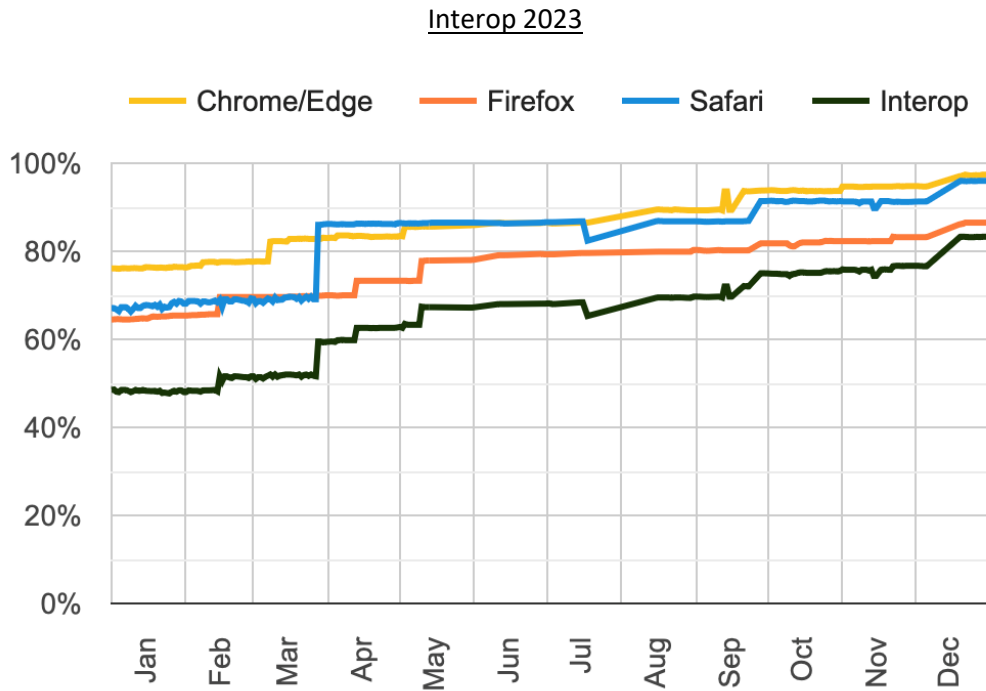
17. The significant new and expanded feature support introduced by Apple over the last year (from March 2023 to February 2024) described in the above section is a strong indicator that WebKit is characterised by a high pace of development. This pace of development, together with improved support for the web standards that are most important to developers, can also be seen from various testing data.
18. Interop 2023 measured browser engine implementations of web standards across 26 active focus areas, which reflect web technologies for which web developers demanded significant improvements. WebKit's performance significantly improved over the course of 2023,

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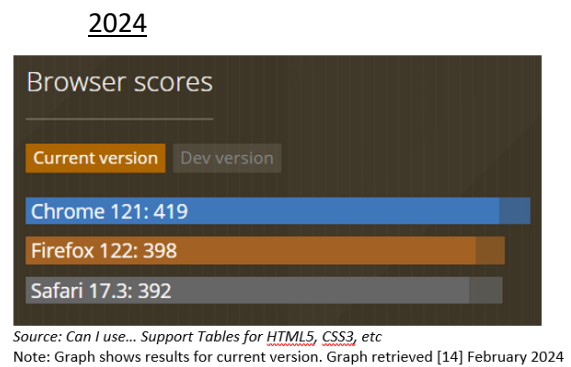
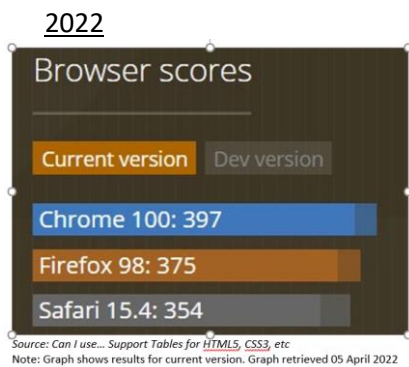
<sup>4</sup> <https://twitter.com/openwebadvocacy/status/1640492875245920256?s=61&t=Ee4BlnZrrdOUTbthTvXUfg>

<sup>5</sup> See for example: <https://shoptalkshow.com/598/#t=56:31>, a podcast about building websites from Dave Rupert and Chris Coyier in January 2024 reacting to Apple's recent releases and noting "*It's cool to see Safari updating regularly and even paving the way, leading on new features*"; similarly, in a 2 February 2024 episode of the Syntax podcast (<https://syntax.fm/show/725/safari-is-the-new-chrome-jen-simmons-of-apple>), the hosts noted that "*Safari has been absolutely killing it lately .. Safari has been first to a lot of this stuff .. I feel like there's been crazy momentum lately ... what's going on at Apple that Safari is doing so well.*"; and in a January 2024 episode of Kevin Powell's channel ([https://www.youtube.com/watch?v=nn3vYS\\_msc0](https://www.youtube.com/watch?v=nn3vYS_msc0)), the discussion centred on "*Safari and how it's been leading the way on a lot of the new big features like Has and container queries amongst a bunch of other ones*".

reaching a score of approximately 96% in the end-of-year stable benchmark. These trends have continued into Interop 2024, where WebKit is currently tied for first in the stable benchmark among all browser engines.



19. The CMA has also previously cited to the ‘Can I Use’ website, which lists which browsers support which features. The two figures below show a summary of the browser scores based on all features tracked on ‘caniuse’ in February 2024, compared to the position during the mobile ecosystems market study in April 2022. Again, these summary charts demonstrate that Safari has been characterised by a significantly higher pace of development than Chrome and Firefox since April 2022. Apple’s score has increased by 38 over that period compared to 23 for Firefox and only 22 for Chrome. Apple notes that its relative pace of development is even higher if the experimental versions of the browsers are taken into account (Apple’s score increases by six while Firefox increases by two and Chrome by one).



20. The above evidence clearly demonstrates that WebKit is in fact characterised by a high pace of development, both in absolute terms and relative to the other main browser engines.

WebKit bug fixes

21. Apple has also continued to diligently introduce new fixes with each WebKit release in recent years. For instance, in Safari 16.4 Apple released a total of 281 bug fixes, and in Safari 17.2 it released a total of 167. And Apple expects to continue this pace with the release of Safari 17.4 and future releases.

#### Conclusion on WebKit

22. In its original Response to the SOI, Apple noted that it works consistently to develop new features for WebKit that benefit web developers and that it empowers developers to build features on top of WebKit to differentiate their browsers. This has fostered competition through the development of features differentiating from Safari and through material new design application UI features. Apple also made it clear that it is committed to releasing new features where they would not compromise device performance, security or privacy.
23. The above developments bear out these submissions and provide further evidence of Apple's ongoing efforts to ensure that WebKit offers the best possible features and functionality to developers whilst maintaining the trusted standards on which end-users rely.
24. Properly assessed, this evidence shows there is no basis on which WebKit could be viewed as having anything but a positive impact on competition for the distribution of web apps, including alternative mobile browsers, on iOS.

#### **ii. Cloud Gaming Services**

##### Background

25. As explained in the SOI, the market investigation's cloud gaming inquiry focuses on whether *"Apple, via its App Store policies and guidelines, in effect obstructs cloud gaming services from being available on iOS devices, in particular because it does not allow a single app to provide a catalogue of games"* and proposed to consider a remedy that would *"requir[e] Apple to remove its App Store restrictions on cloud gaming services"*.
26. As the CMA stated in its Final Report regarding Microsoft's acquisition of Activision, cloud gaming is a nascent and fast-moving segment in the gaming industry, as it is *"a market that has emerged only in recent years."*<sup>6</sup> And while it shows potential, proponents have admitted that cloud gaming faces inherent challenges. Microsoft, who operates successful console and PC platforms, believes cloud gaming *"is a new and immature technology which faces*

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<sup>6</sup> CMA Final Report into the Anticipated acquisition by Microsoft of Activision Blizzard, Inc (April 2023), at paragraph 4.32. The Final Report also noted third-party evidence concerning the challenges with respect to cloud gaming, including that *"it has not yet reached mass adoption, with one of the main reasons being that it can still be associated with 'lag' or latency. It described how to replace console, cloud gaming services needed to prove that the latency question has been addressed, and that internet coverage and data plans need to improve"* (*ibid* at paragraph 8.50).

*significant challenges.*<sup>7</sup> Google, a well-resourced early entrant, shut down its Stadia cloud gaming service last year citing insufficient gamer interest.<sup>8</sup>

27. Apple has carefully monitored the growth and development of the evolving cloud gaming segment, and it has continued to look for ways to support developer innovations and new business models whilst maintaining a safe environment for users in this constantly evolving space.
28. Apple has supported cloud gaming services on iOS by providing developers with two options for offering cloud gaming services to iPhone users: (i) via the web, through websites or web apps; and (ii) through the App Store. Apple's approach to cloud gaming has always been reasonable and pro-competitive, allowing cloud gaming services to be offered on iOS devices through multiple means, promoting discoverability for individual games, whilst also ensuring that users are adequately protected and informed.

#### Changes to App Store Guidelines Regarding Clouding Gaming

29. On 25 January 2024, Apple expanded options for developers to distribute cloud gaming services on the App Store, taking into account feedback from developers, and focusing on areas of particular concern. Developers can now submit a single app with the capability to stream all of the games offered in their catalogue. Following the removal of the old Rule 4.9 from the App Store Review Guidelines,<sup>9</sup> new Rule 4.7 provides that "*Apps may offer certain software that is not embedded in the binary, specifically mini apps, mini games, streaming games, chatbots, and plug-ins*". [Emphasis added]
30. In order to ensure that the App Store continues to provide a trusted place for users to find apps they love, the new Guideline 4.7 still has a number of protections to ensure that users of streaming games through the App Store have an experience consistent with Apple's privacy-preserving and pro-consumer approach to apps generally. The rule specifies that developers are responsible for the software offered in the app and must ensure that such software complies with the Guidelines and all applicable laws. Apple further specifies that, in order to preserve the experience that App Store customers expect, and to help ensure user safety, software offered in apps under this rule must:
  - follow *all* privacy guidelines, including but not limited to the rules set forth in Guideline 5.1 concerning collection, use, and sharing of data, and sensitive data (such as health and personal data from kids);
  - include a method for filtering objectionable material, a mechanism to report content and timely responses to concerns, and the ability to block abusive users;

<sup>7</sup> Microsoft's Response to the CMA's Issues Statement in the Microsoft/Activision merger inquiry, at paragraph 1.11 (available at: [https://assets.publishing.service.gov.uk/media/637cec9dd3bf7f5a0b33f881/MICROSOFT\\_S\\_RESPONSE.pdf](https://assets.publishing.service.gov.uk/media/637cec9dd3bf7f5a0b33f881/MICROSOFT_S_RESPONSE.pdf)). At paragraph 8.13, the CMA also noted Microsoft's submission with respect to cloud gaming on mobile devices specifically, namely that "*with the increasing computational power of mobile devices, many gaming companies are increasingly developing native mobile games, meaning there is unlikely to be material demand for cloud gaming on mobile devices (which Microsoft also submitted depends on the user having a stable internet connection)*".

<sup>8</sup> Google, A Message About Stadia and our Long Term Streaming Strategy, <https://blog.google/products/stadia/message-on-stadia-streaming-strategy/>.

<sup>9</sup> Rule 4.9 provided *inter alia* that "*Each streaming game must be submitted to the App Store as an individual app so that it has an App Store product page, appears in charts and search, has user ratings and review, can be managed with ScreenTime and other parental control apps, appears on the user's device etc.*".



- use in-app purchase in order to offer digital goods or services to end users;
  - not extend or expose native platform APIs to the software without prior permission from Apple;
  - not share data or privacy permissions to any individual software offered in the app without explicit user consent in each instance; and
  - maintain, in the host app, the age rating of the highest age-rated content available in the app.
31. Apple considers that the above requirements for streaming games through the App Store are necessary to ensure that users are not exposed to privacy-invasive games, age-inappropriate content, and/or harmful or objectionable content. These requirements are consistent with the Guidelines for all apps (see, for example, Guidelines 3.1.1 and 5.1.2). The new Guideline 4.7 addresses concerns specific to streaming games apps whilst maintaining a consistent experience across all apps.
32. As Apple has previously explained, it works hard with developers to specifically address the challenges that cloud gaming presents and, as with any other element of the Guidelines, amends the Guidelines to reflect feedback from the developer community while continuing to protect users.

#### Conclusion on cloud gaming services

33. For the reasons set out above, Apple's Guideline changes regarding cloud gaming services address the CMA's concern regarding cloud gaming. The requirement with which the CMA was primarily concerned has been removed. The remaining requirements of Guideline 4.7 do not inhibit in any way the ability of cloud gaming service providers to offer streaming apps through the App Store and are necessary and reasonable protections to ensure that users are not harmed in the absence of individual game app review under this new approach.
34. Apple respectfully submits that the question referred to the Inquiry Group, namely whether there is a feature or a combination of features of the market in relation to the distribution of cloud gaming services through app stores on mobile devices that prevents, restricts or distorts competition, can clearly be answered in the negative.
35. Given the above, and consistent with the Government's Strategic Steer to the CMA on 23 November 2023 that the CMA should "take a proportionate approach to interventions" and "minimis[e] the burdens on businesses engaging with the CMA", Apple submits that its recent change to the App Store Guidelines is sufficient to remove the need for further detailed investigation into cloud gaming services and to preclude the necessity to consider the imposition of remedies with respect to these services.
36. Apple is happy to engage further with the Inquiry Group and the CMA to address any clarificatory questions that the Inquiry Group and the CMA may have in this regard.

#### **iii. Other developments**

37. In its original Response to the SOI, Apple highlighted its leading approach to accessibility. Apple drew the Inquiry Group's attention, in particular, to developer evidence highlighting the superiority of Apple's approach for accessibility apps.



38. Apple notes that it has continued to invest in innovation with respect to accessibility and to bring the benefits of that innovation to developers and end users. In May 2023, for example, Apple introduced new features for cognitive accessibility, along with Live Speech, Personal Voice, and Point and Speak in Magnifier. These updates draw on advances in hardware and software, include on-device machine learning to ensure user privacy, and expand on Apple's long-standing commitment to making products for everyone. They were developed in collaboration with community groups representing a broad spectrum of users with disabilities to develop accessibility features that make a real impact on people's lives.
39. Apple requests that the Inquiry Group give due account to the consumer benefits arising from Apple's efforts in the accessibility sphere. Failure to do so would be in direct conflict with the ongoing steer from Government to make markets work well for vulnerable consumers, as recognized by the CMA.<sup>10</sup>

### C. Comments regarding the remainder of the market investigation

40. Apple's original Response to the SOI highlighted a number of key concerns with respect to the market investigation, including the need to conduct a thorough and fair assessment at the market investigation phase, rather than simply adopting the analysis and findings of the Mobile Ecosystem Market Study.<sup>11</sup> This concern was particularly acute in relation those "findings" or "evidence" that were overstated in the SOI.
41. The original Response also highlighted that, as recognised in CMA guidance, there are three equally important elements to any consideration of remedies: (i) comprehensiveness; (ii) effectiveness; and (iii) proportionality.<sup>12</sup> The risk of disproportionate remedies being imposed was, as Apple set out, particularly acute in relation to cloud gaming, where the SOI appeared to suggest that remedies more broadly related to app distribution, which had already been identified as more appropriately being taken forward by the DMU, appeared to be under consideration.
42. These key concerns remain relevant and, indeed, are strengthened by the significant developments that have taken place since the market investigation was suspended in March 2023. It is clear from those developments that Apple continues to innovate and invest in WebKit, to offer additional functionality, features and support to developers wherever possible, and to remove App Store restrictions where they are no longer required to protect users. Apple's conduct remains, as always, pro-competitive and pro-consumer.
43. Importantly, Apple's approach is also entirely consistent with the Government's own strategic direction for digital markets, which highlights equally key aims including that:
- Digital markets are competitive;
  - Consumers trust they are treated fairly and can exercise choice over the services they access;

<sup>10</sup> See <https://www.gov.uk/government/publications/consumer-vulnerability-challenges-and-potential-solutions/consumer-vulnerability-challenges-and-potential-solutions>. See also <https://www.gov.uk/government/publications/competition-and-markets-authority-annual-plan-2022-to-2023/annual-plan-2022-to-2023>

<sup>11</sup> CC3 (Revised) Guidelines for market investigations: Their role, procedures, assessment and remedies, April 2013, paragraph 63.

<sup>12</sup> Ibid, para 329.

- Citizens are empowered to be safe online, and trust they are protected from online harms beyond their control; and
  - Organisations have the capabilities and resilience to preserve their digital security, and security is factored into new products and services from the outset.
44. A notable theme arising from the components noted above is the fundamental importance of security and trust for digital commerce. This posture reflects the ever-growing number and sophistication of threats in that domain. In that context, Apple would emphasize the continuing value of its integrated and curated system which represents a truly differentiated offering. Indeed, Apple's approach to mobile browsers, browser engines and cloud gaming combines the above elements to ensure that developers are encouraged to innovate and that third parties are provided with the access needed to compete effectively, whilst at the same time addressing the need for security and privacy to be protected, so that consumers have a trusted and safe environment in which to engage in digital transactions.
45. Apple submits that the reopening of the market investigation provides the Inquiry Group with an opportunity to fully explore Apple's continuing efforts in relation to these areas and to give due account to the benefits that these bring. The various significant developments that have taken place since March 2023 also demonstrate that caution should be exercised in considering whether to impose remedies and, if so, how to carefully craft such remedies so that they do not place undue burdens on Apple and/or impede Apple's ability to continue to innovate.
46. Apple fully recognises the importance of the market investigation and the broader UK regulatory context in which it is taking place. It is committed to continuing to work collaboratively with the Inquiry Group and the CMA to ensure that the market investigation progresses successfully, and any concerns are fully and properly assessed and, if necessary, addressed in an effective and proportionate manner, in line with governmental objectives of protecting UK consumers online, for the long-term.

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